

## MINUTES OF DOT-AGC BRIDGE DESIGN SUBCOMMITTEE MEETING

The DOT-AGC Joint Bridge Design Subcommittee met on September 25<sup>th</sup> 2002. Those in attendance were:

Greg Perfetti	State Bridge Design Engineer (Co-Chairman)
Berry Jenkins	Manager of Highway Heavy Division, Carolinas Branch AGC (Co-Chairman)
Ron Shaw	Lee Construction Company of the Carolinas, Inc.
Mark Lively	Crowder Construction Co.
Kevin Burns	R. E. Burns & Sons Co.
Richard Holshouser	Sanford Contractors, Inc.
Ron Hancock	State Bridge Construction Engineer
Steve Dewitt	State Construction Engineer
Tom Koch	Structure Design Project Engineer
K J Kim	Soils and Foundation Engineer
Paul Lambert	Structure Design Project Engineer
Mohammed Mulla	State Soils and Foundation Engineer
Allen Raynor	Assistant State Bridge Design Engineer
John Erwin	Structure Design Project Design Engineer (Secretary)

The following items of business were discussed:

1. The minutes of the May 29<sup>th</sup>, 2002 meeting were accepted.
2. *Rideability Specification*

A copy of the rideability specification was given to the attendees. Mr. Erwin stated that the specification had been revised to incorporate the comments and concerns of the last meeting. The revised specification requires the contractor to temporarily bridge the joints so that the joint locations can be included within the limits of the profilograph test. Mr. Hancock noted that the joints would only need to be bridged in the wheel path of the profilograph machine during the profilograph test. However, the whole joint would need to be temporarily bridged if planing was required.

Mr. Erwin also stated that the quantity of planing that would warrant the elimination of grooving was clarified. Under the revised specification, the Engineer may delete the grooving requirement for any area of the deck that has been planed greater than 1/2" in depth. In addition, the specification states that there shall be no additional compensation made for underruns in grooving. Mr. Shaw asked if the only criteria for deleting the grooving was the depth of concrete removed by grinding. After some discussion, it was concluded that the Engineer may also delete all or a portion of the requirement of grooving if a substantial amount of deck area was planed. Structure Design committed to clarifying the specification with respect to this area before implementation.

Mr. Jenkins asked who would perform the profilograph test since the specification clearly states the testing shall be “performed by an independent provider.” Mr. Hancock responded that in previous jobs when planing was required, the grinding contractor also performed the testing. Mr. Holshouser stated that the grinding companies would probably perform the profilograph testing separate from grinding. Structure Design committed to investigating firms that provide profilograph testing and reporting back at the next meeting.

### *3. Steel Plate Lengths*

Mr. Perfetti stated that he had contacted the major steel fabricators that produce girders for NCDOT and inquired whether increasing the allowable plate length from 120’ to 135’ would be feasible. Mr. Perfetti stated that all the fabricators were in favor of increasing the allowable plate length and that he was currently in the process of working with the Department’s permit group to allow the longer plate lengths. However, a 135’ plate length would be the absolute maximum and no exceptions would be granted. Mr. Perfetti cautioned that even if the longer plate lengths were allowed, there would still be sites with restricted access where lengths would need to be less than 120’.

### *4. Joints in Barrier Rail Transition*

Mr. Holshouser stated that he had recently completed construction of a barrier rail transition and presented pictures to the committee. The barrier rail transition was formed and poured on site.

Mr. Holshouser requested that the construction joint between the approach slab and the barrier rail transition be lowered to the top of the approach slab. When slip forming the bridge rail at the end of the bridge, the mold hits the concrete lip above the approach slab. Structure Design committed to lowering the construction joint.

Mr. Holshouser also stated that the first post of the Type III guardrail anchor unit conflicts with the base course of the approach slab. The approach slab plans detail the 5” concrete base course the same width as the approach slab but extending 1’ beyond the approach slab. Mr. Perfetti suggested that the contractor add another offset block to the post. Mr. Hancock stated that the contractor could also block out this area when pouring the base for the approach slab.

Mr. Shaw stated that the area between the wing wall and the approach slab was susceptible to erosion and washout making this area very difficult to maintain until the roadway contractor paved the area. Furthermore, with the new barrier rail transition detail, the asphalt is difficult to place in that area. Mr. Shaw asked if the area between the wing and the approach slab could be poured simultaneously with the approach slab. Mr. Hancock and Mr. Perfetti supported this idea and Structure Design committed to adding a note on the plans to permit this option.

### *5. Overhang Falsework Standardization*

Mr. Perfetti stated that overhang falsework design was very job specific and concluded that it will be difficult to develop a standard that will cover all situations. However, it would be very beneficial to the DOT and contractors to reduce the amount of time and effort required for submitting and receiving overhang falsework drawings.

Mr. Shaw stated that #5 tie bars are always required in the falsework review and therefore, should be included in the original details and bill of material. Mr. Lambert replied that this could be done but the spacing of the tie bars is dependent on girder and diaphragm spacing and many other variables. Therefore, any standard tie bar spacing would be conservative.

Mr. Holshouser suggested that the contractor submit an overhang falsework submittal for a certain width bridge and diaphragm spacing. Once approved, the design would be kept on file in the Structure Design Unit. In constructing subsequent bridges with equal or less width and smaller diaphragm spacing, the contractor would issue a letter stating that the approved submittal for overhang falsework on file would be used on the current project. Mr. Lambert expressed concerns over this idea stating that other variables such as girder length and spacing also affect falsework designs.

Mr. Perfetti stated that a future goal of the Department would be to allow steel diaphragms in lieu of concrete diaphragms with prestressed concrete girders. With steel diaphragms the spacing of the diaphragms could be decreased, resulting in lower torsional stresses from construction loads and eliminating the need for #5 tie bars. Currently, temporary falsework contributes to resisting these torsional stresses. Mr. Lively asked if the steel diaphragms would be temporary or permanent. Mr. Perfetti stated that the decision would be left to the contractor, but if the diaphragms were permanent galvanization would be required.

Mr. Hancock concluded that if the Department could standardize portions of overhang falsework designs and, for example, omit 50% of the current submittals and reviews, the effort would be considered beneficial. Mr. Hancock stated that the Department would start with small standardizations and progress as practical.

#### *6. Acceptance of Temporary Beams for Temporary Structures*

Mr. Hancock stated that Mr. Steve Walton of the DOT Materials & Tests Unit has expressed concerns that the material information required by the special provision for used beams in temporary structures was not available during the inspections. Mr. Hancock inquired if there was a problem acquiring the needed information. Mr. Holshouser stated that often times the beams come from other states and the information on modifications to the beams is difficult to acquire. Mr. Lambert stated that a sketch detailing the holes in the flange or the locations of any bent flanges should be provided to the Engineer of Record for the temporary bridge so that it might be accounted for in the design.

Mr. Jenkins suggested that a statement be added to the special provision to require the Engineer of Record to provide a statement on the plans certifying that he/she has reviewed the material to be used in the temporary structure and has designed accordingly. Mr. Perfetti stated that he thought the current Special Provision was clear and did not think the DOT should be involved in this process.

After some discussion, it was concluded that since there were only a few occurrences of this problem, the current special provision was adequate. Mr. Hancock stated the only addition to the special provision would be to require either the turn-of-the-nut method or DTI's when using high strength bolted connections.

#### *7. Drain in Reinforced Approach Fill*

Mr. Hancock distributed a Reinforced Approach Fill special provision that contained proposed changes. The proposed changes included eliminating Class II, Type 2 material from the list of optional Select Materials. Mr. Hancock stated that the intent of this change was to ensure the material used in the reinforced approach fill was free draining in order that the required density could be attained. The other proposed change occurs in the Construction section of the special provision. The proposed change requires 100% compaction in the top 8" of select material. However, if Class V material is used, the density tests are not required, but the material must be compacted with at least four passes using vibratory compaction equipment.

Mr. Kim stated that the 4" drain in the reinforced approach fill would be raised to the bottom of the end bent elevation as agreed upon in previous meetings. Currently, the drain pipe is located 1' below the end bent. The contractors of the committee had no objections. In addition, Mr. Kim stated that modifications would be made to the special provision to give guidance on reinforced approach fill construction when the water table is high. Mr. Kim stated that in situations of this nature, the Special Provision will require the contractor to use Class V material in the water and place the reinforced approach fill on top of the Class V.

Mr. Hancock stated that the Soils and Foundation Unit is in the process of creating details for supporting the reinforced approach fill when stage construction is required. Mr. Mulla stated that in stage construction, the contractors can expect to use a stronger filter fabric. Once completed, the details will be presented to the committee for review.

#### *8. VE's on Shoring*

Mr. Hancock stated that recently he had received several value engineering proposals on temporary shoring. Mr. Hancock stated that there are many variables involved in calculating the exact quantity of shoring. Therefore, the department conservatively estimates the quantity and a bid item is included in the contract. Mr. Hancock stated that if temporary shoring were a part of a larger conceptual value engineering proposal then it would be considered by the Department. However, value engineering proposals for temporary shoring alone will not be considered. Mr. Shaw agreed and stated that

the project special provision was clear that any decrease in shoring would simply be considered a reduction in paid quantity.

9. *Other*

i. *Barrier on Fabric Wall*

Mr. Mulla stated that currently an unanchored New Jersey shape barrier rail is detailed 3' from the edge of the fabric wall. However, the Traffic Engineering Unit is requesting that the barrier be located 9' from the edge of the fabric wall if unanchored and 5.5' from the edge of the wall if anchored. Mr. Mulla stated that NC State University is currently conducting research on this matter. In addition, FHWA and ODOT have conducted a crash test on an unanchored F-shape barrier rail. The maximum deflections were substantially less than 9'. The F-shape barrier is preferred over the New Jersey shape barrier because of its larger mass. Mr. Mulla asked if the Soils and Foundation Unit could specify the F-shape barrier. Mr. Perfetti asked if it would be feasible to show other options on the plans in addition to the F-shape barrier. Mr. Shaw agreed and stated that the F-Shape barrier could be shown on the plans as long as the quantity was low and there were other options.

Mr. Hancock stated that the F-shape barrier located 3' behind the wall was an economical option compared to the New Jersey shape barrier located 9' behind the wall. Mr. Jenkins stated that consideration should be given to the fact that changing the barrier rail shape may also affect the size of the impact attenuators. After some discussion, it was concluded that the Soils and Foundation Unit would prepare several options for the committee's review.

ii. *Drilled Shaft Contractor Experience*

Mr. Jenkins asked the committee if they had any concerns over the wording of the drilled shaft special provision with respect to who may perform the work. Currently, the special provision requires the contractor to "submit a list containing a description of at least two projects completed in the last five years on which those responsible for the drilled pier construction have installed drilled piers of similar size as shown in the plans and with similar excavation techniques anticipated for this project". Mr. Jenkins was concerned that this provision may unfairly limit the drilled shaft work to contractors who have prior experience. Mr. Hancock and Mr. Dewitt explained that the Department must ensure that the contractor has proven experience to construct drilled shafts correctly because the inspector is not able to visually verify the quality of the drilled shafts.

Although the contractors on the committee did not consider drilled shaft work feasible for their companies, Mr. Shaw agreed that the special provision did not allow for new drilled shaft contractors to do work in NC. Mr. Shaw suggested that the wording be changed to require experienced personnel and not an experienced contractor. In addition, Mr. Hancock suggested that for new contractors performing drilled shaft work, the test requirements could be increased to ensure quality construction. After some

discussion, it was concluded that any reports from contractors desiring to do drilled shaft construction would be reported back to the committee and the special provision would be revisited at that time.

*iii. Embedded Plates in P/S Concrete Girders*

Mr. Holshouser stated that in prior jobs the embedded plate in the end of prestressed girders has always been the same length. However, in recent jobs, the plate has been detailed with varying lengths. Mr. Holshouser asked if the Department could require the same plate length for all girders. Mr. Erwin stated that the current standards detail two different plate lengths that are dependent on the girder type. Mr. Perfetti stated that the issue should be brought up in the next PCI/DOT meeting before any changes were made.

*iv. Next Meeting*

The next meeting is scheduled for December 11<sup>th</sup> at 10:00 a.m. in the Structure Design Unit Conference Room C.